## IN THE CLAIMS

1. (Original) A method for making a porous sol-gel fiber, the method comprising the steps of:

hydrolyzing a silicate ester with water using a catalyst to form a hydrolyzed solution; transferring the hydrolyzed solution into the cavity of a mold; allowing the hydrolyzed solution to gelatinize to form a sol-gel fiber; removing the sol-gel fiber from the mold; and drying the sol-gel fiber.

- 2. (Original) The method of Claim 1, wherein the silicate ester is tetramethyl orthosilicate or tetraethyl orthosilicate.
- 3. (Original) The method of Claim 1, wherein the volume ratio of the silicate ester to water is 2 or less.
  - 4. (Original) The method of Claim 1, wherein the catalyst is a mineral acid catalyst.
  - 5. (Original) The method of Claim 1, wherein the mold cavity is a tubular cavity.
- 6. (Original) The method of Claim 1, wherein the hydrolyzed solution is allowed to gelatinize for at least two days.
- 7. (Original) The method of Claim 1, wherein the sol-gel fiber is removed from the mold by injecting a fluid into the mold.
- 8. (Original) The method of Claim 1, wherein the drying step comprises allowing the sol-gel fiber to air dry.
- 9. (Original) The method of Claim 1, further comprising a step of incorporating a sensing material into the sol-gel fiber.
- 10. (Original) The method of Claim 9, wherein the sensing material is added to the water used for the hydrolysis.

- 11. (Original) The method of Claim 9, wherein the sensing material is added to the hydrolyzed solution.
- 12. (Original) The method of Claim 9, wherein the sensing material is absorbed into the sol-gel fiber by dipping the sol-gel fiber into a solution comprising the sensing material.
- 13. (Original) The method of Claim 9, wherein the sensing material is optically changeable in the presence of water.
- 14. (Original) The method of Claim 9, wherein the sensing material is optically changeable in the presence of ammonia.
  - 15. (Original) The method of Claim 9, wherein the sensing material is CoCl<sub>2</sub> or CuCl<sub>2</sub>.
  - 16. (Original) A porous sol gel fiber made by the method of Claim 1.
  - 17. (Original) A porous sol gel fiber made by the method of Claim 9.
- 18. (Original) The porous sel-gel fiber of Claim 17, further comprising a cladding material disposed on the fiber.
- 19. (Original) The porous sol-gel fiber of Claim 17, wherein the sensing material is CoCl<sub>2</sub> or CuCl<sub>2</sub>.
- 20. (Original) A method for constructing an optical fiber sensor, the method comprising the steps of:

hydrolyzing a silicate ester with water using a catalyst to form a hydrolyzed solution; transferring the hydrolyzed solution into the cavity of a mold;

allowing the hydrolyzed solution to gelatinize to form a sol-gel fiber;

removing the sol-gel fiber from the mold;

drying the sol-gel fiber; and

positioning the sol-gel fiber between a light source and a light detector.

- 21. (Original) The method of Claim 20, further comprising a step of incorporating a sensing material into the sol-gel fiber.
- 22. (Currently Amended) The method of Claim 21, wherein the sensing material is optically changeable in the presence of moisture or ammonia.
- 23. (Original) The method of Claim 20, wherein the diameter of the air dried sol-gel fiber is about 500  $\mu m$  or less.
- 24. (Original) The method of Claim 20, wherein the length of the air dried sol-gel fiber is at least 1 mm.
- 25. (Original) The method of Claim 21, wherein the sensing material is optically changeable in the presence of water.
  - 26. (Original) An optical fiber sensor comprising:
  - a light source;
  - a light detector; and
  - a transducer;

wherein the transducer comprises the porous sol-gel fiber of Claim 17 and wherein light from the light source passes through the transducer and impinges on the light detector.

- 27. (Original) The optical fiber sensor of Claim 26, further comprising a lens positioned between the light source and the transducer wherein light from the light source is focused by the lens before passing through the transducer.
- 28. (Original) The optical fiber sensor of Claim 26, further comprising a first optical fiber positioned between the lens and the transducer, wherein the first optical fiber is optically coupled to a first end of the transducer such that light from the light source passes through the first optical fiber before passing through the transducer.

- 29. (Original) The optical fiber sensor of Claim 26, further comprising a second optical fiber positioned between the transducer and the light detector, wherein the second optical fiber is optically coupled to a second end of the transducer such that light passing through the transducer passes through the second optical fiber before impinging on the light detector.
- 30. (Original) The optical fiber sensor of Claim 26, further comprising a data acquisition system in communication with the light detector.
- 31. (Original) The optical fiber sensor of Claim 30, wherein the data acquisition system comprises a computer for analyzing data generated by the light detector.
- 32. (Original) The optical fiber sensor of Claim 26, wherein the light source is: a line source; a band source; or a continuous light source coupled with a monochromator or band-pass filter.
- 33. (Original) The optical fiber sensor of Claim 26, wherein the light detector is a photodiode, a photomultiplier tube or a charge coupled detector.
- 34. (Original) The optical fiber sensor of Claim 26, wherein the transducer is positioned inside a chamber.
- 35. (Original) The optical fiber sensor of Claim 34, wherein the chamber comprises an inlet and an outlet such that a fluid flowing into the chamber through the inlet contacts the transducer and exits the chamber through the outlet.
  - 36. (Original) The optical fiber sensor of Claim 35, further comprising:
- a first optical fiber which passes through a first opening in the chamber and is optically coupled to a first end of the transducer inside the chamber such that light from the light source passes through the first optical fiber before passing through the transducer; and
- a second optical fiber which is optically coupled to a second end of the transducer inside the chamber and which passes through a second opening in the chamber such that light passing

through the transducer passes through the second optical fiber before impinging on the light detector.

37. (Original) A method for determining the presence or concentration of an analyte in a sample fluid using the sensor of Claim 26, the method comprising steps of:

contacting the transducer with the sample fluid; and

monitoring the signal from the light detector while directing light from the light source through the transducer.

- 38. (Original) The method of Claim 37, wherein the contacting step comprises positioning the transducer in the sample fluid.
- 39. (Original) The method of Claim 37, wherein the dopant in the sol-gel fiber interacts with the analyte.
- 40. (Original) The method of Claim 39, wherein the monitoring step comprises monitoring the absorbance of the analyte.
- 41. (Original) The method of Claim 39, wherein the dopant forms a complex with the analyte.
- 42. (Original) The method of Claim 41, wherein the monitoring step comprises monitoring absorbance of the complex or fluorescent emissions of the complex.
- 43. (Original) The method of Claim 37, wherein the signal from the light detector is compared to a calibration curve to determine the amount of analyte in the sample.
- 44. (Original) The method of Claim 43, wherein the calibration curve is generated by a process comprising steps of:

contacting the transducer with a first fluid sample having a known concentration of analyte;

monitoring the signal from the light detector while directing light through the transducer to generate a first data point;

contacting the transducer with a second fluid sample having a known concentration of analyte different than the first fluid sample;

monitoring the signal from the light detector while directing light through the transducer to generate a second data point;

optionally generating additional data points using additional fluid samples having known concentrations of the analyte; and

fitting a curve to the data points to generate the calibration curve.

- 45. (Original) The method of Claim 37, wherein the analyte is ammonia and the sensing material is CuCl<sub>2</sub>, the method further comprising a step of exposing the sol-gel fiber to a solution comprising hydrochloric acid after the monitoring step to reset the sensor.
  - 46. (Original) An optical fiber sensor comprising:
  - a light detector; and

a transducer in optical communication with the light detector such that light generated within the transducer impinges on the light detector;

wherein the transducer comprises the porous sol-gel fiber of Claim 17.

- 47. (Original) The optical fiber sensor of Claim 46, further comprising a light source, wherein light from the light source impinges on a surface of the transducer.
- 48. (Original) A method for determining the presence or concentration of an analyte in a sample fluid using the sensor of Claim 46, the method comprising steps of:

contacting the transducer with the sample fluid; and monitoring the signal from the light detector.

49. (Original) A method for determining the presence or concentration of an analyte in a sample fluid using the sensor of Claim 47, the method comprising steps of:

contacting the transducer with the sample fluid; and

monitoring the signal from the light detector while applying light to the surface of the transducer.